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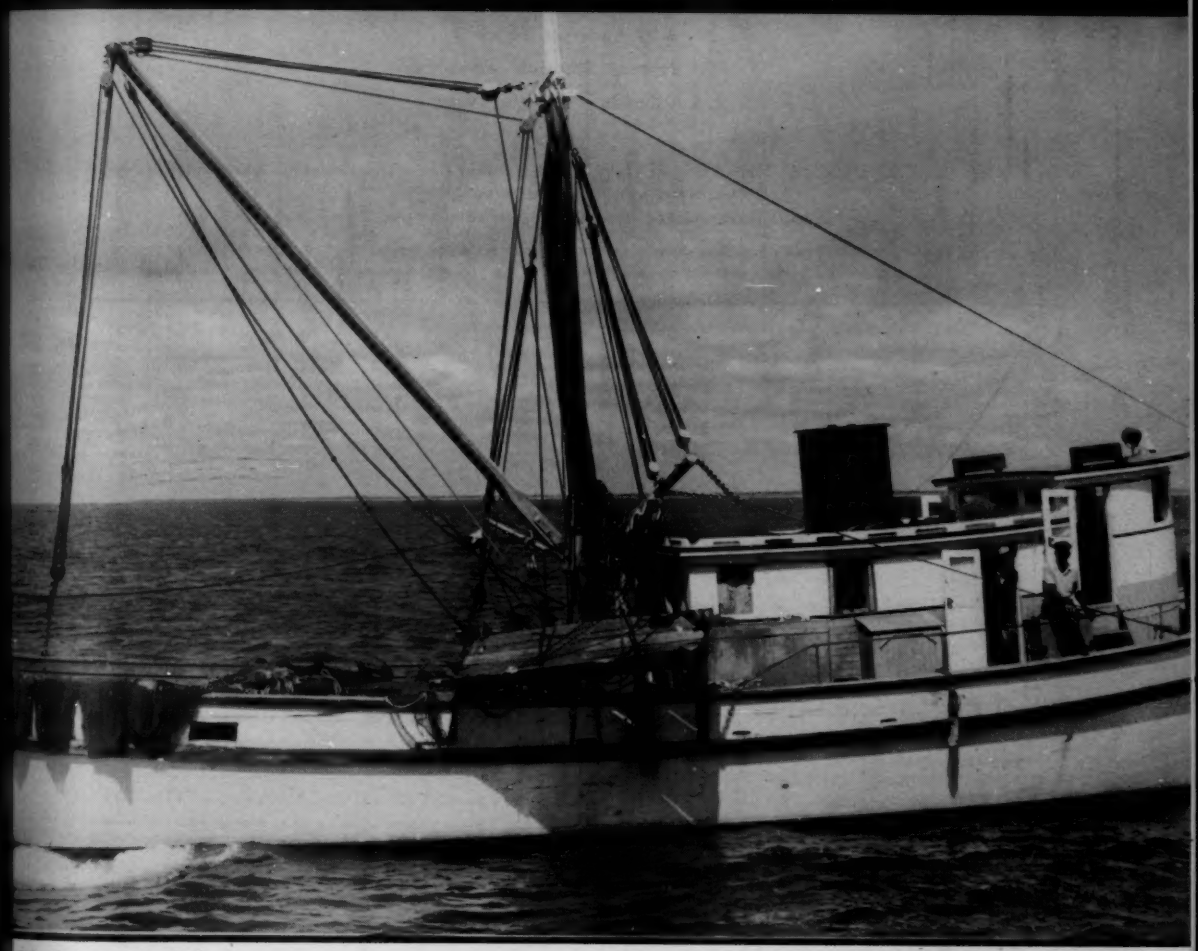
COMMERCIAL FISHERIES REVIEW



Vol. 9, No. 11 NOVEMBER 1947

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, Secretary

FISH AND WILDLIFE SERVICE
ALBERT M. DAY, Director

COMMERCIAL FISHERIES REVIEW

A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES
PREPARED IN THE DIVISION OF COMMERCIAL FISHERIES

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Applications for COMMERCIAL FISHERIES REVIEW, which is mailed free to members of the fishery industries and allied interests, should be addressed to the
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COMMERCIAL FISHERIES REVIEW

November 1947 Washington 25, D.C. Vol. 9, No. 11

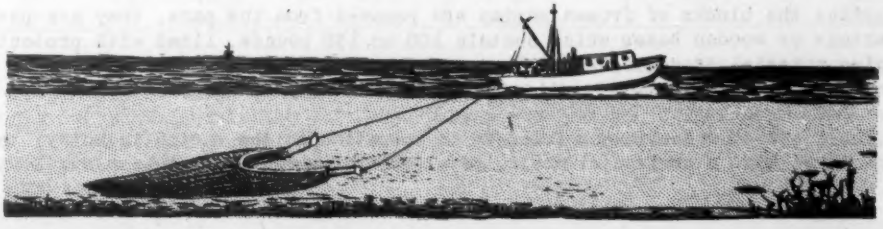
NOTES ON FREEZING SHRIMP

By J. M. Lemon*

Shrimp are one of the most popular of all seafood products available to the consuming public. Due to this popularity, there is an almost universal demand for it during all months of the year. The requirements to supply the market are satisfied by the wide distribution of the fishing grounds and the success with which a good quality product can be preserved by freezing and canning. The largest catch is landed in the South Atlantic and Gulf area. Some States have closed seasons on shrimp fishing. They do not run concurrently, however, so shrimp are caught somewhere in the area throughout the year.

Practically all of the shrimp are captured by means of a trawl which is towed slowly along the ocean floor by the vessel. This trawl is a large funnel-shaped bag flattened at the top and with otter boards on the right and left sides which hold it open so that the shrimp can be entrapped. At intervals, depending upon the volume of shrimp in the bag of the trawl, it is hoisted aboard the vessel and emptied on the deck. The net is again thrown overboard for another drag while the crew of the vessel separate the shrimp from the various other species which also may have been caught in the trawl. As the shrimp are sorted, they are stored in bins in the hold of the vessel with alternating layers of ice and shrimp until the bin is full. Some crews remove the heads of the shrimp while at sea. This saves considerable space in the storage bins, since the tails of the shrimp are the only edible portion and therefore are the most valuable. When the shrimp are landed whole, the head portion is sent to a meal plant and manufactured into shrimp meal which is valuable as a poultry feed.

This first handling operation aboard the vessel is of great importance because of its effect on the market value of the shrimp when they are finally offered for sale. If permitted to lie on the deck of the vessel in the hot sun for several hours, shrimp deteriorate rapidly, and, as a result, the quality is reduced. It is of the utmost importance to pack shrimp in adequate ice at the earliest possible time whether they are to be sold fresh, cooked, canned, or frozen for future sale. Care should be exercised in the handling to be sure that the shrimp are not bruised, since a bruise causes more rapid deterioration by reason of enzyme and bacterial action.



*Chief, Technological Section, Division of Commercial Fisheries, Washington, D. C.

SHUCKING AND GRADING

Upon landing, the shrimp are washed thoroughly with fresh cold water to remove any foreign material. Some of the shrimp are shucked or shelled before freezing. The shucking operation consists of the removal of the shell from the tail portion of the shrimp. This is accomplished by gently squeezing the tail and loosening the shell at the same time. The cold water usually shrinks the meat so that the shell is separated except at a few points and a gentle squeeze will break it loose from those points where it may be attached to the shell.

When the shrimp are landed with heads on, the heads are removed after the washing operation. They are then graded by size according to the number required to make a pound. The sizes vary with the season and fishing area--as the season progresses the shrimp become larger and move from the inshore grounds to the deeper offshore grounds. The large or jumbo size is the most valuable commercially. In some markets, three grades are required, in others only two are common, while the Office of Price Administration set up seven grades for pricing purposes during the life of that organization.

DEVEINING THE SHRIMP

In some of the shrimp handling plants, the sand vein or intestine of the shrimp is removed by hand or mechanically after it has been shucked. In the latter method, the shrimp is fed into the machine in such a way that a rotating plow cuts under the vein and completely removes it. When left in, the vein often turns black and detracts from the appearance when marketed, since it is on the outer side of the tail portion of the shrimp.

PACKING FOR FREEZING

When the shrimp have been graded they are placed in one-, five-, or ten-pound waxed cartons for freezing. The one-pound size is marketed for family consumption, and the larger sizes go to hotels and restaurant trade. Some of these are fitted inside with a liner of some wrapping material which is further protection against oxidation and loss of moisture while the shrimp are in cold storage. In others, the cartons have several holes in the bottom approximately one-half inch in diameter. After the freezing is completed, the cartons are immersed in cold water and quickly removed. The frozen shrimp cause a glaze of ice to form on their surfaces giving them a protective coating, and the surplus water drains from the carton through the holes in the bottom.

Some plants freezing shrimp pack them in metal pans designed for this purpose. They may contain up to 30 pounds, but are usually of five- and ten-pound capacity. The shrimp are packed tightly in the pan and frozen after which the block is removed and glazed by dipping in cold water, or after the pan has been packed with shrimp the spaces between the shrimp are filled with cold water. The shrimp are then frozen in a block. This method reduces evaporation of water from the shrimp to a minimum during the freezing period.

After the blocks of frozen shrimp are removed from the pans, they are packed in cartons or wooden boxes which contain 100 to 150 pounds, lined with protective wrapping material or cellophane. They are then stored for future shipment or may be shipped immediately to distribution points throughout the country.

There are a few continuous freezers in operation in the shrimp industry; these are designed with a horizontal moving metal belt of woven or stainless steel wire.

The freshly washed shrimp drop onto the belt as they come from the washer and are carried through an insulated box fitted with freezer coils. The speed of the belt is so regulated that the shrimp freeze individually while passing through the low temperature of the box. At the discharge end, the frozen shrimp are weighed into cartons containing 30, 40, or 50 pounds and, in a few instances, 100 pounds. The cartons are lined with a protective material or bags fitting the carton. When the carton is filled with the necessary weight, it is sealed and placed in the storage room to await shipment.

FREEZING COOKED SHRIMP

Some of the peeled or shelled shrimp are cooked before freezing. The shrimp are cooked in kettles or vats fitted with steam coils and containing a brine solution. The strength of the solution varies between 5 to 10 percent salt brine, as does the time of cooking, in different establishments. A brine solution of 15 percent strength has been recommended for this purpose by some who have investigated this method of preparing shrimp for freezing, but unless the cooking time is reduced accordingly, deterioration in storage is more rapid. After cooking, the shrimp are quickly cooled and packed in various size cartons. The cartons of frozen cooked shrimp are either stored for future market or are immediately shipped for distribution.

Storing frozen cooked shrimp is a difficult problem since, when the storage period is prolonged, the shrimp become tough and fibrous and the quality definitely deteriorates. It is suggested that the cooking time be held to a minimum. This has been defined as only long enough to cause sufficient hardening of the meat to bring out the pink coloration and make it firm to handle. A time limit of not more than four minutes in boiling brine is suggested. Immediately after the cooked shrimp are removed from the brine, they should be immersed in cold running water so that the cooking or blanching will stop. If the brine bath is prepared in the early morning for use throughout the day and is kept at a boiling temperature throughout the period of operation, a considerable amount of water will evaporate. This will cause a constant increase in the brine strength during the day. As a result, those shrimp cooked in the early morning will be of a different quality than those cooked just before operations have ceased for the day. This can be remedied by checking the brine strength with a salinometer at hourly intervals during the day and adding sufficient water to compensate for the water lost through evaporation.

Table 1 - Salinometer Values for Mixtures of Salt and Water

Salinometer reading	Salt, lb.	Water lb.	Salinometer reading	Salt, lb.	Water lb.
100	26.3	73.7	50	13.3	86.7
90	23.7	76.3	40	10.7	89.3
80	21.1	78.9	30	8.1	91.9
70	18.5	81.5	20	5.5	94.5
60	15.9	84.1	10	2.6	97.4

After cooling sufficiently, they can be packed in the various type packages and either placed in a cooler or immediately in the freezer. A sealed moisture-vapor-proof container is the best type package for shrimp. If these are not available, then the shrimp should be either glazed in blocks or individually by dipping in cold water immediately after freezing.

The storage period for frozen cooked shrimp should not be longer than one month. When stored longer than this, the denaturization has progressed far enough for the quality to be adversely affected. They become tough and a loss of flavor occurs.

PACKAGING SUGGESTIONS

The size, shape, appearance, and material making up the container have a bearing on the success of freezing and storing shrimp. This is true not only from the technical point of deterioration but also from the marketing view.

The size container making up the package selected depends upon the portion of the market it is expected to reach. Hotels and restaurants seldom, if ever, are interested in the one-pound size package, while the homemaker will probably not consider a larger size. In any case, it is advisable for the packer to select a carton of just sufficient size to contain the exact quantity of shrimp with a minimum of space remaining not filled in the package. If considerable air space remains in the package after it is filled, there will be a transfer of moisture from the contents to the inside surfaces of the package. This will result in freezer burn and the development of off odor and flavor of the shrimp in the package. The longer the storage period the greater will be the deterioration from this cause.

In selecting a shape for a package, it should be remembered that a long flat package will freeze quicker than a short thick one. This is a distinct advantage since it is desirable to freeze all of these products as rapidly as possible.

The material from which packages are made should be of a heavy enough grade so that the shape is retained during the handling process. Many of the cartons available are heavily coated on both sides with wax so that they are waterproof and will not lose their shape during the handling. Although the wax on the cartons makes them waterproof and gives them rigidity, it does not form an airtight package which will prevent moisture loss in cold-storage rooms. In order to obtain an airtight moisture-vapor-proof package, it is necessary to use a liner inside the carton or a tight bag of cellophane or some other wrapping material. It is also possible to wrap the container in moisture-vapor-proof material and seal it, this is known as an overwrap and can be made moisture-tight by sealing. A package which will otherwise lose moisture can be made moisture-tight by this procedure.

The appearance of a packaged food has considerable effect upon its retail sales appeal. If a package is neat, clean, and attractive, it is more often purchased when on display in a retail store than one which does not impress the homemaker. This should be kept in mind when preparing any packaged seafood for sale.

There is little available information dealing with the efficiency of freezing in the various types of freezers. It has been reported that in a plate-type froster where the packages are in contact with refrigerated surfaces on two sides, freezing takes place in a period of approximately two hours when the temperature of the plates is -40° F. This is a relatively short time as compared to the cold blast at the same temperature, which requires from six to eight hours to freeze the same weight of shrimp.

VITAMIN A CONTENT OF FUR SEAL OILS

By David T. Miyauchi* and F. Bruce Sanford*

ABSTRACT

Results of tests in 1946 showed the apparent vitamin A potency of oil from livers of Alaskan bachelor seals to vary from 13,105 to 394,145 spec. units per gram of oil with an average value of 112,000. The oil content of livers varied from 0.20 to 2.17 percent by weight. The oil from carcass and blubber contained from 490 to 2,040 spec. units of vitamin A per gram of oil.

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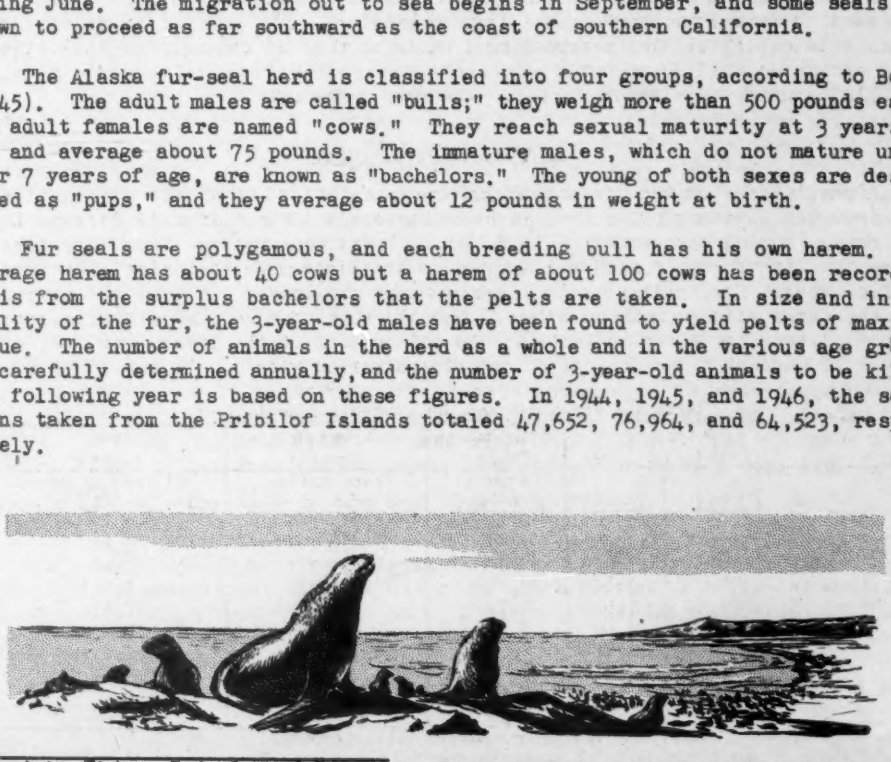
INTRODUCTION

The Alaskan fur seal, Callorhinus ursinus, yields not only a valuable fur but also oil and a protein feeding meal as byproducts. Recently, interest has been expressed as to the oil being a possible commercial source of vitamin A.

The Alaskan seal herd, which is protected by international treaty, has increased to over 3 million animals. Insofar as is known, the Pribilof Islands in the Bering Sea are the only places the herd ever goes ashore. A few of the breeding bulls land as early as the latter part of March, but most of the herd arrive during June. The migration out to sea begins in September, and some seals are known to proceed as far southward as the coast of southern California.

The Alaska fur-seal herd is classified into four groups, according to Bower (1945). The adult males are called "bulls;" they weigh more than 500 pounds each. The adult females are named "cows." They reach sexual maturity at 3 years of age and average about 75 pounds. The immature males, which do not mature until 6 or 7 years of age, are known as "bachelors." The young of both sexes are designated as "pups," and they average about 12 pounds in weight at birth.

Fur seals are polygamous, and each breeding bull has his own harem. The average harem has about 40 cows but a harem of about 100 cows has been recorded. It is from the surplus bachelors that the pelts are taken. In size and in the quality of the fur, the 3-year-old males have been found to yield pelts of maximum value. The number of animals in the herd as a whole and in the various age groups is carefully determined annually, and the number of 3-year-old animals to be killed the following year is based on these figures. In 1944, 1945, and 1946, the sealskins taken from the Pribilof Islands totaled 47,652, 76,964, and 64,523, respectively.



*Chemists, Fishery Technological Laboratory, Division of Commercial Fisheries, Seattle, Washington.

A byproducts plant is located on St. Paul Island in the Pribilofs. During 1943, a total of 58,319 carcasses were handled and yielded 61,099 gallons of blubber oil, 14,160 gallons of carcass oil, and 782,000 pounds of seal meal.

SOUTH AFRICAN EXPERIMENTS

Since no extensive study has been made of the liver of the Alaskan fur seal, the results of the investigation made of the South African fur seal fishery, Black, et al, (1945) may be of interest. It was reported that, in general, the percentage of vitamin A in the livers from bulls was greater than in the livers from pups taken from the same locality. For the livers from bulls, the vitamin A potency depends greatly on the locality from which the seals are obtained. The bulls from the east coast of the Union yield livers consistently higher in vitamin A than those from the southwest African coast. This difference in the vitamin A content of livers of bulls from different localities is believed to be related to the vitamin A content of the food consumed, which consist of fish and squid. The accumulated data indicate that livers of fish from the east coast are also richer in vitamin A than those from the same species on the west coast.

The blubber oil extracted, as reported by these workers, by the customary cooking and pressing method contained no vitamin A, but a blubber oil sample extracted by alkali digestion contained 29 international units of vitamin D per gram.

Since 1942, the seal livers collected on the Government Guano Islands have been sent to Cape Town or Gansbaai for processing. The production of vitamin A in 1944 totaled 163 billion international units, most of it coming from bull livers. It is estimated that if all the available livers had been utilized, a total of 580 billion units of vitamin A could have been produced.

ALASKAN LIVER OILS

A preliminary study investigating the possibilities of the utilization of oils from the livers of the Alaskan bachelor seals as a source of vitamin A has been made. During the summer of 1946, some livers were removed from the bachelor seals. The livers were frozen and shipped to the Fishery Technological Laboratory, Seattle, Wash., for analyses of oil content and vitamin A. The oil was extracted from the liver with petroleum ether. The results of the analysis of eight individual livers are given in Table 1. The oil content of the livers was low, averaging 1.20 percent. The potency of the livers varied widely. In the small number

Table 1 - Vitamin A and Oil Content of Seal Livers

Sample Number	Weight of Individual Liver		Oil Content of Liver	Liver Oil Potency	Liver Potency
	Grams	Pounds	Percent by weight	Spec. units per gram of oil 1/	Millions of spec. units per lb. of liver
1	710	1.56	2.00	394,145	3.58
2	720	1.59	1.12	369,200	1.88
3	840	1.85	2.08	29,780	0.28
4	825	1.82	1.28	35,870	0.21
5	685	1.51	2.17	13,410	0.13
6	840	1.85	0.36	26,665	0.04
7	870	1.92	0.40	13,105	0.02
8	700	1.54	0.20	13,775	0.01
(Av. of 8 samples)	744	1.71	1.20	111,994	0.77
9 2/	-	-	1.38	111,030	0.69

1/ Spec. unit equals 2,000 times E (1%, 1 cm. at 328 millimicrons).
2/ Sample number 9 was a composite of approximately 10 pounds of liver.

of samples analyzed spectrophotometrically, the vitamin A potency ranged from 13,000 to 394,000, and averaged 112,000 spec. units of vitamin A per gram of oil.[1/] Another analysis was made on a composite from about 10 pounds of frozen livers. The oil content of these livers was 1.38 percent, and the vitamin A potency was 111,000 spec. units per gram of oil. Of the eight livers analyzed (Table 1) only livers Nos. 1 and 2, which have potencies of 3.58 and 1.88 millions of spec. units per pound of liver, respectively, show high enough vitamin A content for possible commercial exploitation.

ALASKAN CARCASS AND BLUBBER OILS

The fur seal carcass and blubber oils extracted at the plant in the Pribilof Islands were also analyzed for vitamin A content. The results of the analysis are given in Table 2. By the ultraviolet absorption method of analysis, the carcass and blubber oils had average potencies of 2,025 and 490 spec. units per gram of oil, respectively; by the Carr-Price reaction the carcass oil and blubber oil both had lower potencies of 595 and 120 equivalent units, respectively.

Table 2 - Analyses of Seal Carcass Oil and Seal Blubber Oil for Vitamin A Potency

Item	Amount unsaponifiable fraction in oil	UNSAPONIFIABLE FRACTION VITAMIN A POTENCY: Ultraviolet absorption at 328 millimicrons	UNSAPONIFIABLE FRACTION VITAMIN A POTENCY: Antimony trichloride read at 620 millimicrons	WHOLE OIL VITAMIN A POTENCY: Ultraviolet absorption at 328 millimicrons	WHOLE OIL VITAMIN A POTENCY: Antimony trichloride read at 620 millimicrons
	Percent by weight	Spec. units per gram[1/]	Equivalent units per gram	Spec. units per gram[1/]	Equivalent units per gram
Fur Seal Carcass Oil	4.94	832	603	2,040	603
	4.92	858	597	2,010	594
	4.98	865	612		592
	4.95	869			
	4.95(av.)	856(av.)	604(av.)	2,025(av.)	596(av.)
Fur Seal Blubber Oil	1.90	327		490	121
	1.90	335		493	119
	3.08	334			
	2.92	328			
	2.45(av.)	331(av.)	--	492(av.)	120(av.)

1/ 2,000 times E (1%, 1 cm., 328 mmu.).

The unsaponifiable fraction of the two oils was obtained by the use of the A.O.A.C. method (1945) for saponification and extraction. For the carcass oil, the vitamin A potency obtained for the unsaponifiable fraction by either method of analysis was in fair agreement with the result obtained with the Carr-Price method for the whole oil.

DISCUSSION OF METHODS

The E values at the various wave lengths between 300 and 350 millimicrons were determined for the seal oils. The reliability of the vitamin A analyses by the ultraviolet absorption method can be predicted by examining the E value ratios (Table 3) because Oser, et al, (1945) have found that unless the ratio $\frac{E\ 300}{E\ 328}$ is 0.72 or less, the vitamin A values determined by the ultraviolet method are likely to be unreliable even if the values are determined on the unsaponifiable portion of the oil. The extinction ratios obtained for the fur seal liver oil (Table 3) are typical for those of a normal vitamin A oil. However, the E value ratios of

1/ A spec. (abbreviation for spectrophotometrically determined) unit of apparent vitamin A potency equals 2,000 times E (1%, 1 cm. at 328 millimicrons). The Service will use this designation until a regulatory agency or some other organization will promulgate another designation which will be generally accepted.

the seal blubber and carcass oil show that the vitamin A results by the ultraviolet absorption method may be unreliable due to the extraneous absorption of the light by non-vitamin A materials present in the oils.

Table 3 - Extinction Ratios at Respective Wave Lengths of Light for Seal Liver, Blubber, and Carcass Oils

	Liver Oil	CARCASS OIL		BLUBBER OIL	
		Whole oil	Unsaponifiable fraction	Whole oil	Unsaponifiable fraction
$\frac{E\ 300}{E\ 328}$	0.669	1.194	0.900	1.168	1.214
$\frac{E\ 310}{E\ 328}$	0.850	1.150	1.004	1.130	1.151
$\frac{E\ 320}{E\ 328}$	0.962	1.103	1.015	1.155	1.048
$\frac{E\ 325}{E\ 328}$	1.000	1.041	1.024	1.064	1.030
$\frac{E\ 330}{E\ 328}$	0.982	0.972	0.970	0.958	0.968
$\frac{E\ 340}{E\ 328}$	0.813	0.829	0.778	0.759	0.765
$\frac{E\ 350}{E\ 328}$	0.569	0.690	0.556	0.547	0.524

This preliminary study of the Alaskan fur seal oil has shown that the vitamin A content of the carcass and blubber oils is not only low but that the vitamin A determinations, which were made by the ultraviolet absorption method, are apparently unreliable. Of the eight individual livers that were examined, only two had vitamin A content high enough for possible commercial exploitation. Further studies on a larger number of seal livers are needed to determine the frequency of the higher potency livers and to determine if the vitamin A content of the livers is highly correlated with other characteristics--such as age, weight, or length of the seal--which can be used as an index to segregate the livers of higher potency from those of lower potency.

LITERATURE CITED

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS

1945. Official and tentative methods of analysis, Sixth Edition, p. 599.

BLACK, M. M.; RAPSON, W. S.; SCHWARTZ, H. M.; and VAN RENSBURG, N. J.

1945. The South African Seal Fishery. Jour. Soc. Chem. Ind. 64: 12.

BOWER, WARD T.

1945. The fur-seal industry of the Pribilof Islands. Fishery Leaflet 77. Fish and Wildlife Service, U. S. Department of the Interior.

OSER, B. L.; MELNICK, D.; PADER, M.; ROTH, R.; and OSER, M.

1945. Determination of vitamin A. Ind. Eng. Chem., Anal. Ed. 17: 559-62.

TECHNOLOGICAL RESEARCH IN SERVICE LABORATORIES

SEPTEMBER 1947

Ketchikan, Alaska

Three recipes for the use of starry flounder were developed and tested by the staff taste panel. Starry flounder fillets were frozen and stored to determine their storage characteristics.

* * *

The final testing of salmon cannery trimmings packed in 1946 was completed.

* * *

Whole salmon waste was stored for oil extraction experiments and possible cooperative study with the Experimental Fur Farm at Petersburg.

* * *

Spreads from frozen salmon livers were prepared and placed on test.

* * *

Freezing salmon hearts causes them to collapse and become unfit for canning whole.

* * *

A report on cleaning and preparing sea shells for novelty work was prepared and additions made to a paper on Alaska shrimp traps.

* * *

Further studies were made to determine probable toxicity of clams from different areas. Experimental results indicate that, when present, most of the toxin is fairly evenly distributed throughout the necks of the clams and that the toxin may be scattered throughout the entire clam during steaming prior to shucking.

Boston, Mass.

The manuscript entitled "The Assembly of Various Types of Fishing Nets - I. Iceland Otter Trawls" was completed. Plans were laid to begin collecting material for Part II of "Methods of Net Mending--New England."[1/]

* * *

1/Part I appeared in the March 1947 issue of Commercial Fisheries Review, pp. 1-17.

A canvass of producers of canned fishery products was made in connection with the procurement of canned fish items for relief feeding purposes in Europe.

* * *

An address entitled "Fish Sanitation" was delivered at the Massachusetts Public Health Conference at Amherst.

* * *

Plans for a survey of clam beds were discussed with the State of Maine.

* * *

Manuscripts on the "Bacterial Population of Brining Tanks in Fish Filleting Plants" and "Fish Handling Practices in New England" were submitted for review and publication.

College Park, Md.

Canned sandwich spreads to be utilized in the school lunch program were prepared from Atlantic mackerel, striped bass, shad, chum salmon, and puffers.

* * *

Preliminary studies made with frozen eastern crab meat covered with weak brine indicate that toughening or discoloring of the meat was prevented during one month of freezer storage.

* * *

Six recipes were prepared and tested for inclusion in a cookery bulletin on rosefish.

* * *

Microscopic agglutination tests on serums from crab meat pickers were completed.

* * *

The arsenic content of some fish killed by the "red tide" was found to be within hitherto reported normal limits for the vertebrate marine species, or less than three parts per million. The small fish appeared to have the lowest arsenic content. There were no indications that death was in any way due to presence of arsenic.

Seattle, Wash.

A collaborative assay is being conducted in connection with the establishment of a new vitamin A standard to be discussed at the annual meeting of the American Oil Chemists' Society.

* * *

Methods of sampling seal oil from the Pribilofs were studied.

* * *

Recipes using fresh and canned salmon were developed and tested and aid given the State Extension Service in connection with its forthcoming fish cookery leaflet.

* * *

Large quantities of dried and extracted salmon waste products were prepared for use by other collaborating agencies in the salmon waste utilization project.

* * *

The initial examination of salmon packed with added oil has revealed no undesirable changes.

* * *

Some riboflavin assays have been completed and a report on nutrition in hatchery fish begun.

* * *

New refrigeration facilities are now available, although storage temperatures cannot be held exactly constant until the final controls are installed.

* * *

Almost 21,000 people have seen the 35 mm. print of "Filleting and Packaging Fish."

* * *

Continued activities were required in connection with the Pacific Explorer, particularly a suggested future program, and preparation of expedition data.

OTHER FISHERY NOTES

Additions to the Fleet of Fishing Vessels

A total of 101 vessels received their first documents as fishing craft during September 1947, compared with 105 in the same month the previous year, according to information received from the Bureau of Customs, Treasury Department. The State of Louisiana led with 19 vessels documented during the month, followed by California with 15 vessels, and North Carolina with 9 vessels.

Vessels Obtaining Their First Documents as Fishing Craft

Section	September		Nine mos. ending with September		Twelve Months
	1947	1946	1947	1946	1946
	Number	Number	Number	Number	Number
New England	7	6	65	53	86
Middle Atlantic	5	9	55	52	74
Chesapeake Bay	9	5	77	50	71
South Atlantic and Gulf	47	55	363	260	351
Pacific Coast	26	25	344	318	375
Great Lakes	4	2	63	59	76
Alaska	3	2	28	19	19
Hawaii	-	1	18	8	17
Unknown	-	-	12	13	16
Total	101	105	1,025	832	1,085

Note: Vessels documented by the Bureau of the Customs are craft of 5 net tons and over.

Alaskan Fisheries Hearings

The Report (Part 2) of the Committee on the Merchant Marine and Fisheries, House of Representatives, which held hearings on the Alaskan fisheries during August 6, 7, and 12, 1946, has been printed. Copies may be obtained from the Committee on the Merchant Marine and Fisheries, House Office Bldg., Washington 25, D. C.

Canadian Import Restrictions

The Canadian Government has placed a wide range of goods under import control by an order in Council passed on November 12, 1947, and effective on November 18, 1947. Complete import prohibition will apply to one large group of goods and restrictions on a quota basis will apply to another group. Included in the list on which complete import prohibition applies are:

Crabs, clams or shrimps in sealed containers (canned)
Turtles
Oysters, shelled, in bulk (shucked oysters)
Oysters, shelled, in cans (canned oysters)
Oysters in the shell

The national "quota" which will apply to the goods permitted importation on a quota basis is arrived at by taking, as a base, the average total dollar value of imports for each category of merchandise during the years 1937, 1938, and 1939.

This average total dollar value is then doubled and becomes the national "quota" for total imports of each category. Some of the items under quota are:

Rubber clothing and clothing made from water-proofed cotton fabrics - Quota percentage - 400 percent
Gloves and mitts of all kinds, n.o.p. - Quota percentage, 200 percent
Rubber boots and shoes - " " " " "
Trawls, trawling spoons, fly hooks, sinkers, swivels, sportsmen's fishing reels, bait, hooks, and fishing tackle, n.o.p.-Quota percentage, 200 percent

Citizens Food Committee

Those members of the fishing industry who pledged support of the Citizens Food Committee's program with respect to fishery products have received the following letter dated November 10, from Mr. Luckman, Chairman of the Committee:

Dear Member of the Fish Industry:

Please allow me to give you my warm thanks for your fine pledge of cooperation to the Citizens Food Committee. It is typical of the splendid spirit shown by the entire fish industry, if I can judge from the scores of similar letters and telegrams that I have received in the past two weeks.

I want you to know that all of us on the Citizens Food Committee appreciate your splendid attitude, and your willingness to help.

As I have promised, the Citizens Food Committee is going to do all it can to stress the importance of fishery products in the food savings program. With such really fine cooperation from you and your associates, I am sure we will succeed.

With best regards, I am

Sincerely,

Charles Luckman

Charles Luckman

Fats and Oils Situation

Production of oils and fats from domestic materials in the year beginning October 1947 is likely to be somewhat larger than a year earlier, according to the October issue of The Fats and Oils Situation. Output of vegetable oils will be larger, owing to sharply increased production of cottonseed and flaxseed in 1947. Output of animal fats probably will decline moderately, partly because of the substantial reduction in the 1947 corn crop.

Export supplies of oils and fats in world surplus-producing areas are likely to continue to increase in 1947-48, although probably not as rapidly as in 1946-47. Last year, exports of Philippine copra, Antarctic whale oil, and Chinese tung oil increased sharply over a year earlier. Increases in 1947-48 probably will come mainly from the Netherlands Indies and Africa.

European import demand for fats, oils, and oilseeds is continuing strong. Poor crops in Europe this year have increased European import needs for foods, and fats and oils are a relatively inexpensive source of calories. Demand for oils and fats in the United States also remains strong, as consumer income and industrial activity are at record peacetime levels. Prices of oils and fats in the United States will remain high as long as these conditions continue.

United States Fish Supplies

The United States civilian demand for fish during the remainder of 1947 and in 1948 probably will be strong as a result of prospects that supplies of meat, poultry, and eggs will be tight, according to the October-December 1947 issue of The National Food Situation.

Total supplies of fish for the remainder of 1947 are expected to be about the same as in the same period of 1946 despite smaller cold storage stocks on October 1 than on the same date a year ago. If market prices continue firm and fishing weather is favorable, production of fresh and frozen fish may increase more than seasonally between now and the spring of 1948. Canned fish supplies in the coming year will be larger than in 1947. Compared with the 1946 production, the 1947 pack of canned salmon is slightly larger, the tuna pack about 20 percent greater, but sardine production is smaller.

The price of fish between now and the middle of spring of 1948 may be somewhat higher than in the early part of 1947 depending on the extent to which consumers in the United States will substitute fish for meat, poultry, and eggs, and on supplies and prices of these agricultural commodities.

Prices of fresh and frozen fish began rising in September and are expected to reach the levels prevailing in the last few months of 1946. The prices of the major species of canned fish--salmon, sardines, and tuna--might rise somewhat above the records of recent months.

Imports of fresh and frozen fish, principally groundfish fillets (cod, haddock, hake, pollock, cusk, and rosefish) are expected to be much larger this winter and in 1948 than in the past year. Canned fish imports next year may not be much larger than they have been in 1947.

Military requirements for canned salmon, sardines, and tuna out of the 1947 pack probably will total about 14 million pounds as compared with a million pounds out of the 1946 pack. The United States Army may procure about four million pounds of canned whiting, herring, and mackerel for civilian feeding programs in conquered areas. Exports of fresh and processed fish in 1948 are expected to be less than in 1947.

Mission on Science and Technology

A Mission on Science and Technology will shortly be established in the United States Embassy in London. The Mission will consist of a small staff of scientists and engineers, headed by Professor Earl A. Evans, Jr., Chairman of the Department of Biochemistry, University of Chicago. The activities of the Mission will cover the fields of organic chemistry, biochemistry, physics, engineering, biology, and agronomy, and the personnel will be assigned for short-term periods on a rotating basis.

The principal duty of the Mission will be to supply to interested persons and agencies in Great Britain information concerning current developments in science and technology in this country, and to acquire for distribution to interested Government agencies and scientific societies in the United States similar information developed in Great Britain.

The Mission is charged with the following specific duties:

1. Aiding and facilitating the exchange of scientific personnel and information between the United States and Great Britain;

2. Developing and maintaining close personal contact with British governmental agencies and other research institutions in the United Kingdom;

3. Answering inquiries originating with United States Government departments and scientific agencies in the United States with respect to particular developments in Great Britain;

4. Stimulating the exchange of scientific and technical reports, especially where these are not generally available through usual channels. The results of the Mission's work will be furnished to interested Government agencies and to scientific and engineering societies in the United States for further dissemination to the whole scientific and engineering community.

Saskatchewan Fisheries Survey

"The Report of the Royal Commission on the Fisheries of the Province of Saskatchewan," recently issued by the Provincial Government is the work of a Commission appointed in May 1946. It was headed by Professor W.A. Clemens of British Columbia and held hearings during the summer. The report is divided into four parts—introduction, commercial fisheries, sport fishery, and general.

The introduction includes the background of the investigation, the names of the fishes, and a description of the general topography of the Province.

The second and main part of the report covers the commercial fisheries, their history, production,

processing and marketing, and the relation of fishing to the economic and social life. Since 90 percent of the fish taken commercially in Saskatchewan are marketed in the United States, the latter's prices and regulations influence the success of the Provincial fisheries. The Province has a difficult problem in getting its fish marketed on account of the high parasitic infestation of certain fishes in a number of the lakes, the long distance to markets, and the scattered population. Production is now controlled by closed seasons, mesh size and net length regulations, limits on the poundage which may be taken from each lake, and inspection of the fish for quality. Other methods of management are being tried. Marketing is being assisted by the building of filleting plants and by the establishment of the Saskatchewan Fish Board.

The sport fishery section discusses its size and importance, and its relation to commercial fisheries. The last part of the report covers the organization of the Fisheries Branch, the need for statistics and additional scientific investigations, and ends with 75 recommendations for the improvement of production and marketing of fish in Saskatchewan. A short bibliography is included.

Copies may be obtained at $1.00 each from the Administration Branch, Department of Natural Resources and Industrial Development, Provincial Natural Resources Building, Regina, Saskatchewan, Canada.

Scientists Tag 20,000 Seal Pups

Scientists of the Department of the Interior, aboard the motorship Black Douglas cruising in the north Pacific have "tagged" nearly 20,000 seal pups in their investigation of the migration routes and food habits of the Alaskan fur-seal herd, the Fish and Wildlife Service announced on November 16. The pups were marked with metal tags attached to their flippers.

Recoveries of the tagged seals at sea during the coming months or years will yield specific information on the migration habits of the seals. In 1950, when this year's pups will be ready for killing, a statistical study of the recoveries of marked 3-year-olds on the killing grounds will make possible a check on the accuracy of seal censuses taken by other methods.

The investigation was started in 1941 on recommendation of the Department of State, after Japan notified the U. S. Government that on October 23, 1941, it would abrogate the Fur-Seal Treaty of 1911 which prohibited the killing, capturing or pursuing the animals at sea. The Japanese Government claimed that the fur-seal herd, at least in part, was damaging its fishing industry. Early investigations did not agree with this contention and the State Department recommended that the Fish and Wildlife Service bring up-to-date its scientific data on seals to determine the validity of Japan's claims. Great Britain, Russia, Japan, and the United States were signatories to the 1911 treaty.

The Black Douglas, a schooner yacht, was purchased in 1941 by the Service and was refitted at Savannah, Ga., but before it reached Seattle, war was declared

and the expedition was suspended. The vessel was requisitioned by the Navy and during the war was in the patrol service. It left Seattle to resume the investigation last spring.

Dr. Victor B. Scheffer, in charge of the biologists on the Black Douglas, now plans to chart the passage of the seals from their breeding grounds on the Pribilof Islands in the Bering Sea to ascertain what they eat and to analyze the hazards the herd encounters during the nine months they spend at sea.

On the first trip of the Black Douglas, from May to August, the scientists observed the seals traveling northward along the coast of British Columbia and Alaska, but only when they neared the Pribilofs were any large groups of seals seen.

During the killing season from June 10 to July 31, a total of 61,447 fur-seal skins were taken. Included were nearly 10,000 from the 4-year-old class, taken experimentally this year to determine whether they are significantly more valuable to the fur trade. Ordinarily, only 3-year-old bachelor seals are killed. Not until these 4-year-olds have been processed and sold will the results of this experiment be known.

Since 1910 when the Government assumed direct control of the fur seals 1,367,322 sealskins have been cropped for market, worth approximately $40,000,000.

In mid-November, the vessel will leave St. Paul Island to travel westward in the wake of the migrating seals, as far as the International Date Line, to observe particularly how far they venture into the waters of the western Pacific. Toward the end of November the expedition will turn southeast and observe the seals on their southbound journey.

State Department Consultant

The Department of State announced on October 17 the appointment of Frederick L. Zimmermann of Forest Hills, Long Island, N. Y., as consultant in the Fisheries and Wildlife Branch, International Resources Division. Mr. Zimmermann is being added to the staff to assist in the development of an international fisheries conservation program for the Northwest Atlantic Ocean. Funds for this specific project were appropriated by Congress for the 1947-48 fiscal year.

Mr. Zimmermann is at present special adviser to the Atlantic States Marine Fisheries Commission, a member of the faculty at Hunter College in New York and is also Research Director of the New York Joint Legislative Committee on Interstate Cooperation. He is a native of Brooklyn and a graduate of Columbia University.

Following completion of his college training, Mr. Zimmermann served the term 1930-36 as a member of the New York State Assembly. During most of 1943 he was a member of the staff of the Department of State assigned to fishery programs.

U. S. Aids Venezuela Fish Industry

A fishery mission headed by a biologist of the United States Fish and Wildlife Service will explore the coastal waters of Venezuela during the next year in an effort to help this South American country increase its production of aquatic food, Albert M. Day, Director of the Fish and Wildlife Service, announced on November 19.

The mission is being undertaken at the request of the Government of Venezuela, which approached the State Department of the United States with a request for technical aid in developing its fishery resources. The expenses of the mission are being borne by Venezuela.

Two representatives of Venezuela came to Washington to complete arrangements for the fishery mission. They were Sr. Julian Veroes, Chief of the Division of Fisheries, Ministry of Agriculture and Animal Husbandry, and Dr. Werner Mora, a fishery biologist of the Ministry of Agriculture.

The Fish and Wildlife Service has detailed Robert O. Smith of its Office of Foreign Activities to the Venezuelan survey for one year, after which the work will be continued by Dr. Mora. Sr. Veroes, Dr. Mora, and Mr. Smith left Washington for Louisiana to purchase a fishing vessel for use in the survey. They were then to proceed to Venezuela.

The cooperative survey now being undertaken will result in better knowledge of the extent and distribution of the fishery resources, and will aid in determining how large an annual yield they can provide, Mr. Day said.

The annual catch of fish by Venezuelan fishermen is now at least 100,000,000 pounds annually. Because of the nature of the offshore currents and the ocean bottom adjacent to the coast line, it is believed that fishery resources may be extensive enough to support considerably larger catches.

Fertility of the Venezuelan waters is influenced by the equatorial current which sweeps northward from the Brazilian and Guianan coasts, bringing quantities of nutrient salts washed down by the large rivers of the area--the Amazon, Maroni, Couranti, Essequibo, and Orinoco. These nutrient salts induce a rich growth of the microscopic sea life which provides food for fishes.

The largest Venezuelan fishery is the one for several species of sardine-like fishes, almost the entire production of which is canned. Large fisheries also exist for Spanish mackerel, and for red snapper, groupers, and other reef fishes.

A large portion of the Venezuelan population is dependent on fish for food, and increased production is needed to supply domestic demand. According to a report of the Venezuelan Ministry of Development, about 20 percent of the population of the country lives from the fish in marine and fresh waters.

Purchases of Fish by Department of Agriculture

The U. S. Department of Agriculture purchased 247,158 actual cases of fishery products valued at $818,249 during September. It became necessary, after contracts had been signed for the purchase of 175,000 cases of hake, to amend the contracts to permit the substitution of herring in order to complete the fulfillment of the contracts.

Purchases of Fishery Products by USDA

Commodity	Unit	September 1947		July thru Sept. 1947	
		Quantity	F.O.B. Cost	Quantity	F.O.B. Cost
FISH			Dollars		Dollars
Hake, canned	Cases	45,000	137,700	65,838	200,214
Hake, " 1/	"	175,000	540,000	175,000	540,000
Herring, "	"	18,858	126,185	79,179	291,829
Mackerel, "	"	-	-	36,798	143,309
Minced tuna, canned	"	7,800	12,564	7,800	12,564
Shad, canned	"	500	1,800	500	1,800
Total	"	247,158	818,249	365,115	1,189,716

1/Contract was later amended to permit substitution of herring on undelivered balance.

Wholesale and Retail Prices

Average wholesale prices of foods rose 0.7 percent during the week ending August 16, according to the Bureau of Labor Statistics, U. S. Department of Labor.

Consumers' food prices rose 1.8 percent between July 15 and August 15, according to the same source. For the second successive month, higher prices for

Wholesale and Retail Prices

Item	Unit		Percentage change from--	
Wholesale: (1926 = 100)		August 16,1947	July 19,1947	August 17,1946
All commodities	Index No.	152.7	+1.6	+19.0
Foods	do	172.3	+2.6	+15.7
Fish:		August 1947	July 1947	August 1946
Canned salmon, Seattle:				
Pink, No. 1, Tall	$ per doz. cans	4.309	+13.0	+98.8
Red, No. 1, Tall	do	5.582	- 1.4	+37.4
Cod, cured, large shore, Gloucester, Mass.	$ per 100 pounds	13.50	0	0
Herring, pickled, N. Y.	¢ per pound	12.00	0	0
Salmon, Alaska, smoked, N. Y.	do	35.00	0	0
Retail: (1935-39 = 100)		August 15,1947	July 15,1947	August 15,1946
All foods	Index No.	196.5	+1.8	+14.8
Fish:				
Fresh and canned	do	262.4	+0.7	+10.4
Fresh and frozen	¢ per pound	38.2	0	- 4.8
Canned salmon:				
Pink	¢ per pound can	42.4	+1.9	+66.2

meats, eggs, and dairy products were chiefly responsible for advancing the Retail Food Price Index to a new high of 196.5, 110 percent above August 1939.

Prices of meats, poultry, and fish as a group, increased 4 percent during the period reaching a level of 139 percent above August 1939. Over the month consumers paid 4 to 7 percent more for beef and pork cuts and 1 percent more for veal and fish.

FOREIGN FISHERY TRADE

Canada

PORT PRIVILEGES EXTENDED TO U. S. FISHING VESSELS: The Canadian Government has extended for the calendar year 1948 the customary port privileges granted in previous years to United States halibut fishing vessels engaged in fishing in Pacific Coast waters for halibut and sablefish, according to the American Embassy at Ottawa.

The United States, through the lapse of wartime legislation, has been unable to continue to grant reciprocal port privileges in Alaska to Canadian fishing vessels, and the Canadian Government was so informed by the Embassy. The Canadian action has been taken despite the absence of similar privileges on the part of the United States in 1947 and probably in 1948.

The Canadian Department of Fisheries is considering the suggestion of the feasibility of working out some permanent reciprocal solution to the problem of port privileges.

Mexico

FISHING REGULATIONS: Commodore Antonio Vazquez del Mercado, Director General of Mexican Merchant Marine, has furnished the U. S. Embassy a copy of his order to port captains, No. C-2215, Circular 140, dated August 5, 1947, translation of which follows:

> "To avoid infringement of fishing regulations by port captaincies in issuing exit permits to Mexican vessels or vessels engaged in commercial or sport fishing when their outfitters, charterers, crews, or passengers have not previously obtained the proper permit or concession from the Directorate General of Fisheries and Allied Industries, you will please order the employees in charge of navigation services in your port captaincy that beginning with the date on which you receive the present communication they shall not handle any application for departure for vessels in the traffic cited if that application does not contain the approval of the fishing inspector or persons substituting him in your port.
>
> "At places here there may be no fishery inspection office, the captain of the port, prior to authorizing the exit permit, shall require that the interested persons prove that they are authorized by the Directorate General of Fisheries and Allied Industries to engage in that activity.
>
> "Foreign fishing vessels despatched 'via a la pesca' by the offices of fisheries inspection at Salina Cruz, Oaxaca; Ensenada, B. C.; San Diego, Calif.; or San Pedro, Calif.; when they arrive at any of our ports by reason of unforeseen or forced causes, shall, through their captains, deliver such despatches to the port captaincy, not to be returned until their departure, note being made thereon of the reason for their arrival and the departure permit, with their respective dates. In case these vessels do not have the aforementioned clearances, your port captaincy shall draw up a detailed report and advise this office by urgent telegram; guard shall be placed over them and no departure permit shall be granted them until authorized by this office."

The Director General explained that the circular was issued solely to assure the approval of both Mexican fishing inspectors and port captains at Mexican ports of departures of fishing vessels engaged in fishing operations in Mexican waters, and was not intended to change departure requirements in effect prior to date of issuance.

The Director General stated that United States fishing vessels, not having Mexican licenses, putting in at Mexican ports by reason of force majeure or for supplies need not obtain Mexican fishing licenses. He said possession of clearance papers issued at preceding foreign port is considered sufficient, without Embassy's intervention, to assure that Mexican fishing inspectors and port captains will grant clearances without delay, even though there may be fish aboard caught on the high seas or in waters of other countries. He said the order to hold vessels under guard pending determination by Central Mexican authorities is intended to apply only to vessels entering Mexican ports without clearance documents of any kind. The Director General informally assured that he will consult with the Embassy concerning the cases of any United States vessels thus detained with the understanding that he will cooperate toward effecting the earliest possible release of vessel in accordance with desire of Mexican Merchant Marine to avoid difficulties in departure of United States vessels.

* * * * *

FISHERY NOTES: The following information relative to the fisheries of Mexico is based on translations made by the U. S. Embassy in Mexico of articles appearing in Mexican papers.

CANCELLATION OF FISHING PERMITS: The Ministry of Marine, through the Director General of Fisheries, intends to cancel fishing permits which are not in order and thus to end surreptitious smuggling of giant shrimp by American fishing boats.

Currently, there are some 50 vessels in the Gulf of Campeche engaged in the capture of shrimp in the huge banks located in the estuaries and bays along the coast of Tabasco and Campeche. All boats fishing shrimp, including those of cooperatives, packing plants, etc., will be checked to see that their documents are in order.

For this purpose, the Chief of the Fishery Inspection Office of the Director has gone to Ciudad del Carmen, Campeche, with definite instructions to proceed to enforce the Fishery Law.

In the Ministry of Marine it is known that there is a tremendous amount of giant shrimp exported to the United States, and that there are vessels anchored at Laguna del Carmen and Campeche constantly, loading shellfish as though it were any other commodity.

There is no occasion to take action with reference to these vessels as they duly pay their fees to the treasury and have everything in order; but if any irregularities are found in the permits of the fishing cooperatives or private companies, they are to be cancelled in order to stop the smuggling.

It is also known that smuggling is carried on by foreign vessels over which the Director of Fisheries has no control and which cannot be patrolled by the coast guard boats assigned to the Gulf of Campeche. It is against the activities of these clandestine ships particularly that effective measures will be taken.

DANGER TO FISHING IN LAGUNA MADRE: The Director General of Fisheries of the Ministry of Marine learned of the danger of a paralysis in fishing activities in Laguna Madre as a result of the extinction of marine species due to the gradual filling in of the canal connecting this lagoon with the sea.

If the species become extinct, the families of 3,000 fishermen will be left in a difficult situation, and for this reason the necessary requests have been submitted to the Under Secretary to have a dredge sent there as soon as possible.

The Director added in his report that he wishes to put an end to the exploitation of the fishermen by the permissionnaires in the ports of northern Tamaulipas, since in Matamoros and nearby ports, only unorganized fishermen are working and they are required to turn over the products of their fishing at low prices because they do not have the vessels and equipment necessary to fish for their own account.

The Director General of Fisheries plans to establish a fishermen's colony at Jesús María and to unify all the seamen of the region. When this has been done, they will request the necessary aid of the government to organize fishing cooperatives such as those which operate in other ports and fishing stations on the coasts of the Gulf, the Pacific, and the Caribbean.

DEVELOPMENT OF MARINE WEALTH: The Ministry of Marine, through the Director General of Fisheries, anticipates the approval of the First Magistrate of the Nation, Attorney Miguel Aleman, of the budget of the department, which will be reorganized next year in order to utilize ocean resources to the best advantage of the country.

Currently, the budget of the Director General of Fisheries amounts to 800,000 pesos ($164,000) and it is proposed to increase it to $615,000, based on the fact that this department alone has been responsible for an increase of $2,050,000 annually in revenue to the treasury.

If this budget is approved, the Director General of Fisheries will found schools for fishermen on the Gulf and Pacific coasts, in which the fishermen and their children will receive technical training; and light armed boats will be obtained for the purpose of eliminating smuggling from Mexican ports near the United States. These armed boats will confront smugglers frequenting the beaches near the borders of the United States and Guatemala and defying the patrol of the authorities.

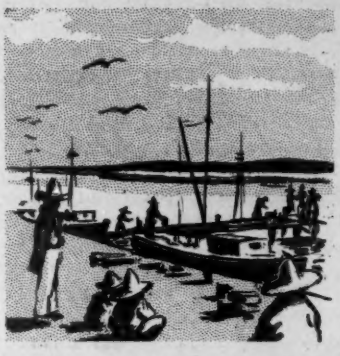
There will be a greater number of technicians, and inspectors will be better remunerated and will therefore perform their duties better.

EXPANSION OF THE PATROL FLEET: The results of the inspection on the east coast made by the Director General on all the aspects of the old Mexican problem of the fisheries will be the subject of a report submitted to the President of the Republic. The report will contain a program for the development and production of Mexican marine resources for the benefit of the country, and a suggestion that adequate measures be taken to attain this end.

Meanwhile, the Congress of the Union is studying a bill covering a necessary and timely increase in the budget for the Director of Fisheries of the Ministry

of Marine. This increase will be used for the selection and expansion of an adequately remunerated marine police force from whom it will be possible to demand greater services, and primarily for the acquisition of patrol planes and fast armed launches to be mobilized and operate with the gunboats and coast guard boats against vessels operating to the detriment of the Federal treasury and the country.

ORGANIZATION OF FISHERMEN: Under the auspices of the Matamoros, Tamps., Fishery Inspection Office of the Ministry of Marine and the Labor and Economy inspectors of the region, several hundred fishermen who now not only live in misery and are exploited by intermediaries, but because of the rudimentary and even illegal fishing methods which they use, constitute a menace to the survival of the species, are to be organized into fishery production unions or cooperatives. For the two reasons mentioned above, there has already begun the organization of fishermen into unions in cases where they deal through an agent, and into cooperatives in instances where they both catch and sell the fish. In both cases, success is anticipated for the workers themselves and in the observance of the fishery laws, since through the union it will be easier to control undue exploitation by the agents, and since by means of the production cooperatives they will be able to obtain credit, boats, and adequate equipment. Both in Matamoros and Laguna Madre there are plans to found fishermen's towns and ports where those who now work independently may settle together with their families.



This organization of labor unions and cooperatives will be more important upon the conclusion of the Fisnery Treaties which the Mexican Government is negotiating with the United States and Cuba. These treaties will lead those countries to accept a system of reciprocity in the fisheries in Mexican waters.

Newfoundland

FOREIGN EXCHANGE IN SALE OF CODFISH: Newfoundland exporters of salt codfish have been deeply concerned with the possible effects of the present serious foreign exchange situation on the export of salt codfish from Newfoundland, according to the American Consulate General at St. John's, Newfoundland. Owing to recent British foreign exchange restrictions, Newfoundland exporters were unable to convert into dollars the sterling received from European buyers. This was the more serious because of the relatively heavy dependence of exporters on the European market--primarily Spain, Portugal, Greece, and Italy.

On September 20, 1947, the Newfoundland Commissioner for Natural Resources announced that the Newfoundland Commission of Government would make available to exporters of salt codfish from Newfoundland to markets where sales had to be made in sterling the equivalent in dollars of the sterling paid. The dollars thus made available would come out of Newfoundland's own dollar surplus, and the sterling thus exchanged would be held--for the time being--in London.

The complete text of the statement made by the Commissioner for Natural Resources follows:

"I had hoped to make this announcement before now, for I know how anxiously you have been awaiting news of the effect on the salt codfish industry of Newfoundland, which depends heavily upon European markets, of the decision by His Majesty's Government in the United Kingdom to suspend the convertibility of dollars, and of the measures being taken to counteract any resultant loss to the people engaged in the industry. The Government of Newfoundland has been fully aware of your anxiety and no less appreciative of your patience in this time of doubt and uncertainty. The Government has worked unceasingly on your behalf, and I am now glad to be able to tell you that our efforts have met with success and that the immediate difficulty has been surmounted.

"What was happening was that sales to European buyers who were short of dollars could be made in sterling, but the sellers could not convert the sterling into dollars. Consequently, trade came to a stop when there were no more dollars. The arrangement now made, stated shortly and simply, is that the Commission of Government will make available to exporters of salt codfish from Newfoundland to markets where sales must be in sterling the equivalent in dollars of the sterling paid. Those dollars will come out of Newfoundland's own dollar surplus which, fortunately, has been accumulated, and held readily available for an emergency such as this. The sterling thus exchanged will be held, for the time being at any rate, on Newfoundland's behalf in London, and the question of its subsequent use will be one for further examination with the authorities in the United Kingdom.

"A situation which, if prolonged, would have led to incalculable loss to the fishermen and the danger of collapse in an industry vital to Newfoundland's economy, has been met. The fishermen are now assured that the prices that they will get for fish this year will not be reduced because of the exchange problem, though there may be next year another problem to be faced and solved, I am happy to acknowledge the stabilizing influence of the exporters with whom, through the Newfoundland Fisheries Board, I have been in close and constant touch throughout this difficult time."

Norway

GERMAN TRAWLERS: The building of 100 German trawlers will continue despite the Norwegian Government's protest, according to a Royal Norwegian Information Service's report on an AP dispatch. In a note which answered the protest, Great Britain advised that the Allied Control Council in Berlin had approved the building of the trawlers. Norway's protest was based on the assumption that a restoration of the German trawler fleet would compete with Norway's own fishing industry.

FEDERAL LEGISLATION, DECISIONS, ORDERS, ETC.

Food and Drug Administration

PROPOSED CHANGES FOR CANNED OYSTERS: The Food and Drug Administration on October 10 issued a proposed definition and standards of identity for canned oysters on the Atlantic, Gulf, and Pacific Coasts. Previously, the standard of fill of container for oysters required a drained weight of oysters of not less than 68 percent of the water capacity of the container (7⅛ ounces for No. 1 picnic can) where the average drained weight per oyster was less than ⅛ ounce. The proposed standard will require that "the standard of fill of container for canned oysters is a fill such that the drained weight of oysters taken from each container is not less than 59 percent of the water capacity of the container."

The proposed order, as it appeared in the Federal Register for Friday, October 10, is reproduced below.

CANNED OYSTERS

DEFINITIONS AND STANDARDS OF IDENTITY: STANDARDS OF FILL OF CONTAINER

It is proposed that, by virtue of the authority vested in the Federal Security Administrator by the provisions of the Federal Food, Drug, and Cosmetic Act (secs. 401, 701; 52 Stat. 1046, 1055; 21 U. S. C. 341, 371); on the basis of the evidence received at the hearing duly held pursuant to notice issued on June 6, 1947 (12 F. R. 3726); and upon consideration of proposed findings of fact filed herein by the Gulf-South Atlantic Oyster Canners Association, which are adopted in part and rejected in part as is apparent from the detailed findings made below; the following tentative order be made:

IDENTITY

Findings of fact.[1] 1. Oysters are canned commercially in the United States on the Atlantic, Gulf, and Pacific Coasts. The oysters on the Atlantic and Gulf Coasts are of the species Ostrea virginica. (They are often referred to as "Eastern Oysters".) The common name of oysters of this species when canned, is "Oysters" or "Cove Oysters". Two species of oysters, Ostrea gigas and Ostrea lurida, are grown on the Pacific Coast. Oysters of the latter species, known as Olympia oysters, are not now commercially canned, but this is due to economic reasons, and oysters of this species are suitable for canning. Oysters of the species Ostrea gigas, commonly known as Pacific oysters, are canned in considerable quantities. (R. 33, 35, 95, 156–158, 161, 178–179, 523–525, 535, 536–537)

2. Pacific oysters are much larger, are somewhat more tender, and easier to break or tear, than Eastern oysters. The methods used for canning Eastern oysters and Pacific oysters are essentially the same. They are described in finding 3. (R. 8, 31, 52, 95, 158, 162, 174, 523–524, 526)

3. Oysters in the shell are steamed until the shell opens. The partially cooked oysters are removed from the shells, washed to remove extraneous matter, such as sand, pieces of shell, etc., and packed into containers. Water is added to fill the container, leaving only a small head space. (Such water is known as a "packing medium".) Salt may be added for seasoning. The containers are sealed and processed by heat to prevent spoilage. (R. 31–32, 48–49, 97–101, 109–111, 116–117, 134, 517–519)

4. Eastern oysters are commonly canned whole. Sometimes the large sizes of Pacific oysters are cut into two or more pieces before canning, or are sliced, and sometimes broken and torn oysters are segregated and canned together. Some oysters are broken or torn in removing them from the shells and some in washing and in packing into containers. During processing and subsequent handling of the canned product small pieces of the outer surface of the oysters often break off. When oysters are canned as they come from the shuckers without cutting or slicing, the name of the oyster ingredient is "Oysters", without any modifying term. When oysters are cut into two or more pieces, or when torn or broken oysters are segregated and canned, the oyster ingredient is known as "Pieces of Oysters". When oysters are sliced, the oyster ingredient is known as "Sliced Oysters". The designation "Diced" has sometimes been used but is not appropriate since the oyster does not lend itself to cutting into small cubes, and if so cut the pieces lose their shape in processing and subsequent handling. (R. 34–35, 41, 49–52, 69–71, 88–89, 110, 185, 269–270, 288, 417–419, 459–470, 477–486)

5. Canned Eastern oysters and canned Pacific oysters are sold in the same trade channels. Generally speaking, consumers distinguish between them on the basis of the difference in size. The canned Eastern oysters being smaller are generally used for oyster stews. The Pacific oysters being larger may be used for frying or for stews. (R. 17–21, 67, 75, 95, 158, 417–418, 445–446, 519, 524, 526, 532, 534–537, 624; Ex. 4, 5, 6, 7)

6. Canned oysters consist of cooked oysters in a watery liquid. The proportion of oysters to liquid depends largely on the quantity of oysters placed in the container before the packing medium was added. The watery liquid surrounding the oysters contains salt and soluble material extracted from the oysters. It has an oyster taste and is useful in making oyster stews, but is usually discarded if oysters are used for frying, although it may be used for some other purpose. This liquid is less valuable than the oysters. (R. 31–32, 42, 52 (a), 76, 167–170, 447–447 (a), 454, 513, 525–526, 535–536, 624, 625)

7. Occasionally oysters for canning are not steamed prior to removal from the shell. Such raw oysters, after washing, are packed directly into the container with or without packing medium, and the container sealed and processed. Even if no packing medium is added to the raw oysters, a watery liquid separates from them during processing. Raw oysters may be blanched and packed into containers with the liquid in which they are blanched as a packing medium, or with additional water and salt. Sometimes the liquid draining from cleaned shell oysters during the presteaming is collected and used, with or without added water and salt, as a packing medium. (R. 31–32, 39–42, 45, 49, 52–54, 55–57, 76, 78, 123–125, 134, 165–166, 168–169, 180–181, 453–454, 457, 513, 519, 523–524, 532, 553–555)

8. The flavor of canned oysters is influenced by the canning procedure used, but the final canned product in all cases is a mixture of cooked oysters and watery liquid. The processes described in finding 7 are suitable unless the product contains too much liquid and too little oysters. The quantity of oysters in a container, however, is more properly related to the fill of container than to identity. (R. 31–32, 42, 45–46, 76, 124–125, 453–457, 553–555)

[1] The citations following each finding of fact refer to the pages of the transcript of the testimony and the exhibits received in evidence at the hearing, which are the basis for these findings.

Conclusions. Based on the foregoing findings of fact it is concluded that it will promote honesty and fair dealing in the interest of consumers to adopt a definition and standard of identity for canned oysters as follows:

§ 36.5 *Canned oysters; identity; label statement of optional ingredients.* (a) Canned oysters is the food prepared from one or any mixture of two or more of the optional forms of oyster ingredients specified in paragraph (b) of this section, and a packing medium of water, or the watery liquid draining from oysters before or during processing, or a mixture of such liquid and water. The food may be seasoned with salt. It is sealed in containers and so processed by heat as to prevent spoilage.

(b) The optional forms of oyster ingredients referred to in paragraph (a) of this section and described in subparagraphs (1), (2), and (3) of this paragraph are prepared by removing oysters from their shells and washing. They may be blanched. The oysters may be steamed while in the shell.

(1) Whole oysters with such broken pieces of oysters as normally occur in removing oysters from their shells, washing, and packing.

(2) Pieces of oysters obtained by cutting oysters into pieces or by segregating pieces of oysters broken in shucking, washing, or packing whole oysters, or by both such cutting and segregation.

(3) Sliced oysters obtained by slicing whole oysters.

(c) (1) When the optional form described in paragraph (b) (1) of this section is used, the name of the food is "Oysters" or "Cove Oysters", if of the species Ostrea virginica; "Pacific Oysters", if of the species Ostrea gigas; or "Olympia Oysters", if of the species Ostrea lurida.

(2) When the optional form described in paragraph (b) (2) of this section is used, the name of the food is "Pieces of ---------", the blank being filled in with the name "Oysters" or "Cove Oysters", if of the species Ostrea virginica; "Pacific Oysters", if of the species Ostrea gigas; or "Olympia Oysters", if of the species Ostrea lurida.

(3) When the optional form described in paragraph (b) (3) of this section is used, the name of the food is "Sliced ---------", the blank being filled in with the words "Oysters" or "Cove Oysters", if of the species Ostrea virginica; "Pacific Oysters", if of the species Ostrea gigas; or "Olympia Oysters", if of the species Ostrea lurida.

(4) In case a mixture of the optional forms described in subparagraphs (1), (2), and (3) of this paragraph is used, the name is a combination of the names of the optional oyster ingredients used, arranged in order of predominance by weight of the optional forms.

FILL OF CONTAINER

Findings of fact. 1. Conservation Order M-81 of the War Production Board effective in 1942, required, among other things, that canned oysters be packed in cans of certain sizes, the smallest of which was the No. 1 picnic can, $2^{11}/_{16}$ inches in diameter and 4 inches high. It also required that the No. 1 picnic can of oysters be filled to yield a cut-out weight of not less than 7½ ounces. These requirements with respect to canned oysters remained in effect until 1946. (R. 67, 94, 204, 443, 448, 544, 550)

2. The standard of fill of container for canned oysters issued under authority of the Federal Food, Drug, and Cosmetic Act, effective February 23, 1945 (9 F. R. 14008), requires a drain weight of oysters of not less than 68 percent of the water capacity of the container (7½ ounces for the No. 1 picnic can), where the average drained weight per oyster is less than ½ ounce. There is no requirement in such standard for drained weight in case the canned oysters are of larger size. (R. 16, 36–38, 65–66, 94; Ex. 3)

3. Canned oysters packed on the Atlantic and Gulf Coasts are generally of such size as to be subject to the requirements of the standard of fill of container. Since the latter part of 1942 they have been so packed as to yield a drained weight of 7½ ounces for the No. 1 picnic can, with drained weights for other cans in proportion. The increased fill made necessary by Conservation Order M-81 and by the standard of fill of container under the Food, Drug, and Cosmetic Act, caused some minor manufacturing difficulties and some changes in the character of the canned oysters. The food contained much less liquid; sometimes the oysters tended to stick together in the can; possibly they were slightly softer; there was more likelihood of the oysters being twisted and of being broken in packing. (R. 17, 30, 44, 94–97, 126, 131–133, 139, 204, 451–453, 457–458, 459, 461–463, 466–467, 480, 481, 485–486, 493–494, 513, 519, 546–547, 551–552, 556, 562; Ex. 3)

4. Pacific oysters were not canned in any significant quantity while the requirements of Conservation Order M-81 with respect to canned oysters were effective, but canning was resumed in 1946. Most of the canned Pacific oysters, on account of their large size, are not subject to the requirements of the Food and Drug Administration's standard of fill of container for canned oysters, and when canning was resumed they were generally packed to yield the cut-out weight in use prior to 1942. The cans so packed were not well filled with oysters. (R. 17, 63–64, 78–81, 125–126, 150, 161, 177, 178, 192, 204, 265, 390–391, 418, 431–432, 443, 621, 634–635; Ex. 3, 8)

5. Soon there appeared on sale in the same market areas, canned Pacific oysters in No. 1 picnic cans with cut-out weights of slightly over 5 ounces of oysters, and from the Atlantic and Gulf Coasts canned oysters in the same size cans with cut-out weights of 7½ ounces of oysters. The canned Pacific oysters were often labeled to show the total weight of oysters and liquid in the can but not the drained weight of oysters. The difference in the amounts of oysters present was known to wholesale dealers, but was not generally known to retail dealers or to the final purchasers. This is a condition likely to confuse and deceive consumers. (R. 17–21, 62, 64, 67, 93–94, 125–126, 133, 158, 444–446, 633, 634; Ex. 4, 5, 6, 7, 21)

6. There has been no commercial canning of Pacific oysters where cans were filled to capacity with oysters, and it is impossible on the basis of commercial experience to determine the maximum fill of such oysters which can be used without impairment of quality. Experimental packs sponsored by canners of Pacific oysters were said to show impairment of quality at any point over the fill in use prior to 1942. The factors of quality used in judging these packs and the relative weights assigned such factors were arbitrary and not reasonably related to trade or consumer concepts of quality. (R. 44, 193, 204, 214–219, 238–251, 252–253, 267, 271–278, 279–409, 526–529, 566–602, 603–606, 620, 625, 653–700; Ex. 14 (A), (B), (C), (D); 15 (A), (B), (C); 16 (A), (B), (C), (D), (E), 17, 18, 19, 20, 21)

7. Experimental packs of Pacific oysters made by the Food and Drug Administration showed that it is possible to can Pacific oysters so as to comply with the standard of fill of container now applicable to canned oysters of an average drained weight of less than ½ ounce, without substantial change in quality from that of the commercially canned Pacific oysters having a much lower drained weight. (R. 37–38, 67, 93, 107, 114–115, 120, 121, 125–126, 630, 631, 638, 639, 640, 642, 653–700; Ex. 9 (A), (B) (C); 10 (A), (B), (C); 11 (A) to (Q) inclusive; 12)

Conclusions. It would not promote honesty and fair dealing in the interest of consumers to so reduce the requirements of the present standard of fill of container for canned oysters as to return to the fill in use prior to 1942.

It would not promote honesty and fair dealing in the interest of consumers to make separate standards of fill of container for canned oysters of different sizes or for oysters of different species.

A reasonable standard of fill of container based on drained weight of oysters, and applicable to oysters of all sizes and species, which takes into consideration the difference between commercial canning and experimental canning, is a standard requiring that the drained weight of oysters be not less than 59 percent of the water capacity of the can.

It will promote honesty and fair dealing in the interest of consumers to amend the standard of fill of container for canned oysters (§ 36.6) by striking out paragraphs (a) and (b) of § 36.6 and by substituting therefor a new paragraph (a) as follows:

(a) The standard of fill of container for canned oysters is a fill such that the drained weight of oysters taken from each container is not less than 59 percent of the water capacity of the container.

Paragraphs (c), (d), and (e) of § 36.6

afe hereby designated as paragraphs (b), (c), and (d), respectively.

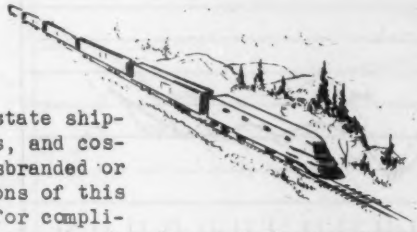
Any interested person whose appearance was filed at the hearing may, within 20 days from the date of publication of this order in the FEDERAL REGISTER, file with the Hearing Clerk of the Federal Security Agency, Office of the General Counsel, Room 3255, Federal Security Building, 4th Street and Independence Avenue, SW, Washington, D. C., written exceptions thereto. Exceptions shall point out with particularity the alleged errors in the order and shall contain specific references to the pages of the transcript of the testimony or to the exhibits on which each exception is based. Such exceptions may be accompanied with a memorandum or brief in support thereof. Exceptions and accompanying memoranda or briefs should be submitted in quintuplicate.

Dated: October 4, 1947.

[SEAL] OSCAR R. EWING,
Administrator.

FOOD, DRUG, AND COSMETIC ACT

Fishery products represent but one group of food commodities among many that are subject to the form of control provided by the provisions of the Food, Drug, and Cosmetic Act, but sea foods collectively constitute an important item for consideration in the planning of our regulatory operations. Let me explain briefly this form of control.



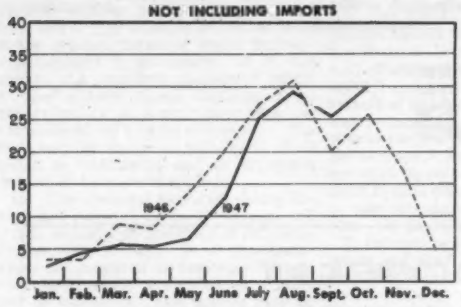
The Act prohibits the interstate shipment or importation of foods, drugs, and cosmetics which are adulterated or misbranded or otherwise violative of the provisions of this law. It places the responsibility for compliance upon the shipper, our functions in general being strictly regulatory in character. It provides for seizure by a process of libel of condemnation of violative articles found within its jurisdiction, also for criminal prosecution of the shipper, and for injunction proceedings to restrain manufacturers or shippers from violating the law. Under the import provisions articles offered for import are subject to examination by the Food and Drug Administration at time of entry. If found violative they must be refused admission or the importer may be given the opportunity to bring them into compliance. The law does not provide for the supervision of production and packing operations of foods by the Food and Drug Administration, except in one respect which is of interest in connection with this hearing. By the terms of the so-called Sea Food Amendment of 1934 to the old Food and Drugs Act, which has been continued in force and effect in the present Food, Drug, and Cosmetic Act of 1938, sea foods are granted rights to a form of voluntary supervisory inspection not provided for other commodities.

--Statement by L. D. Elliott, Assistant Commissioner of Food and Drugs, Food and Drug Administration, Federal Security Agency, before the National Resources Economic Subcommittee of the Senate Committee on Public Lands, July 2, 1947.

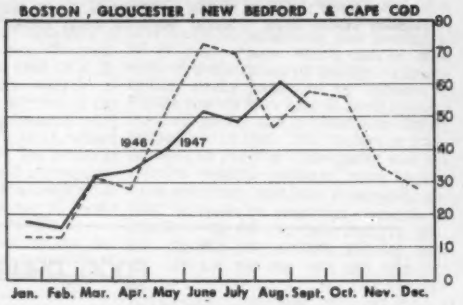
LANDINGS AND RECEIPTS

In Millions of Pounds

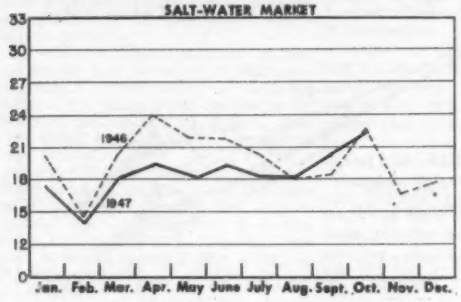
MAINE - LANDINGS
NOT INCLUDING IMPORTS



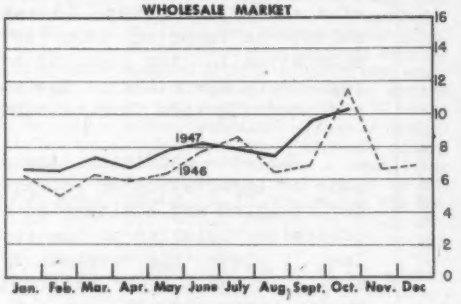
MASSACHUSETTS - LANDINGS
BOSTON, GLOUCESTER, NEW BEDFORD, & CAPE COD



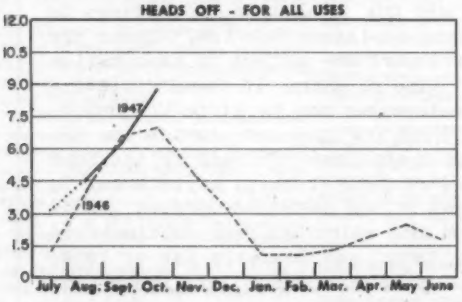
NEW YORK CITY-RECEIPTS OF FRESH & FROZEN FISH
SALT-WATER MARKET



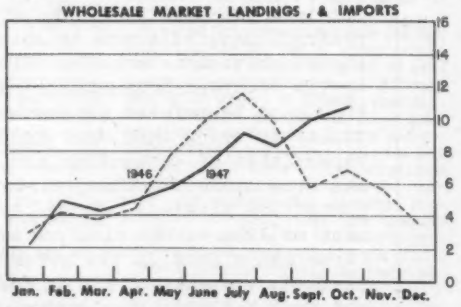
CHICAGO - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKET



GULF - SHRIMP LANDINGS
HEADS OFF - FOR ALL USES

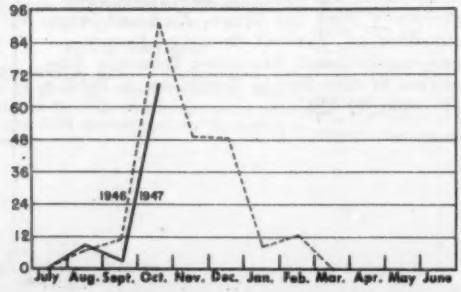


SEATTLE - RECEIPTS OF FRESH & FROZEN FISH
WHOLESALE MARKET, LANDINGS, & IMPORTS

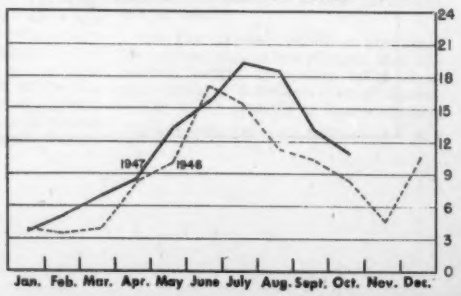


In Thousands of Tons

CALIFORNIA - PILCHARD LANDINGS



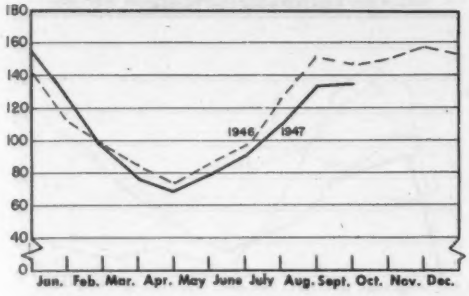
CALIFORNIA - TUNA LANDINGS



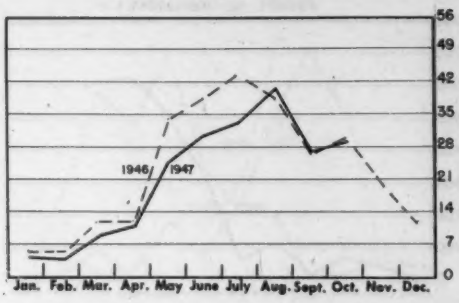
COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

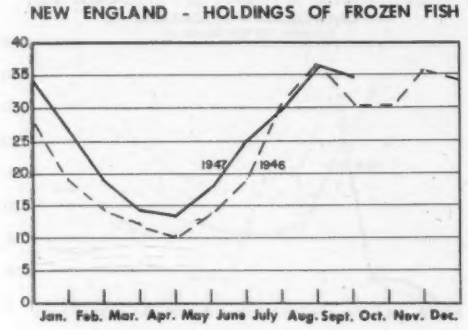
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



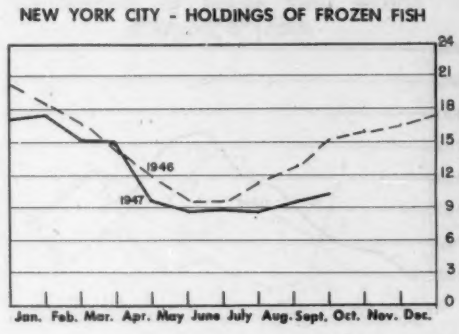
U.S. & ALASKA - FREEZINGS



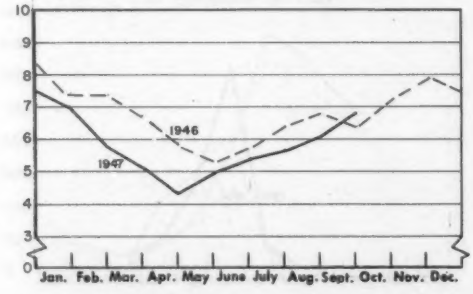
NEW ENGLAND - HOLDINGS OF FROZEN FISH



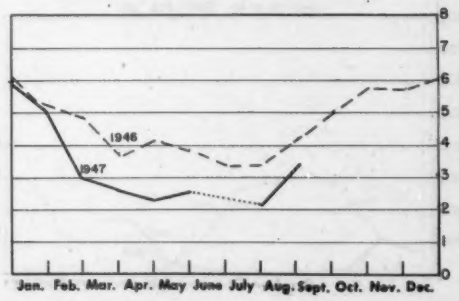
NEW YORK CITY - HOLDINGS OF FROZEN FISH



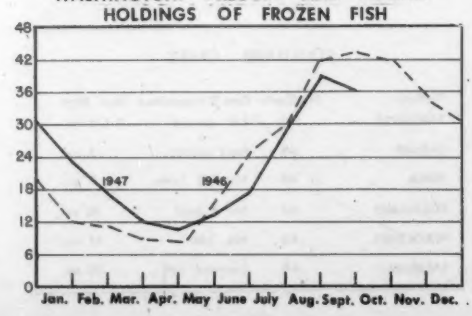
CHICAGO - HOLDINGS OF FROZEN FISH



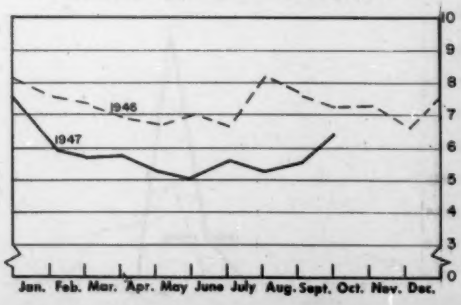
GULF - HOLDINGS OF FROZEN FISH



WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH



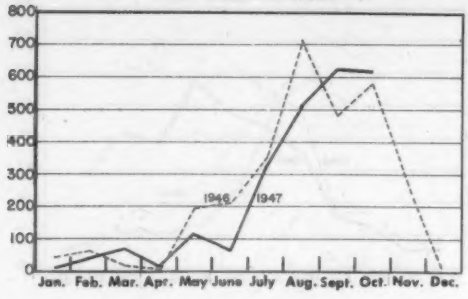
CALIFORNIA - HOLDINGS OF FROZEN FISH



CANNED FISHERY PRODUCTS

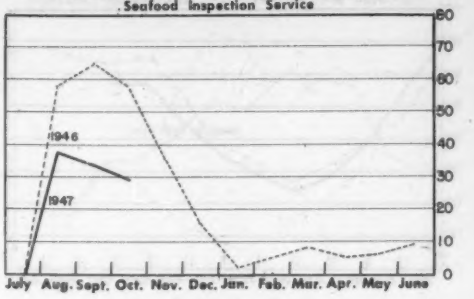
In Thousands of Standard Cases

MAINE - SARDINES, ESTIMATED PACK

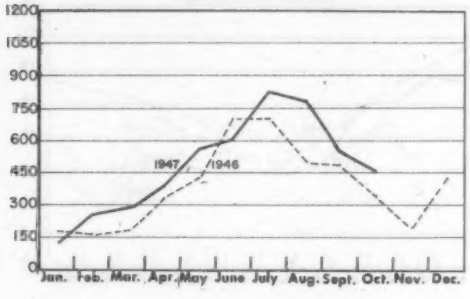


UNITED STATES - SHRIMP

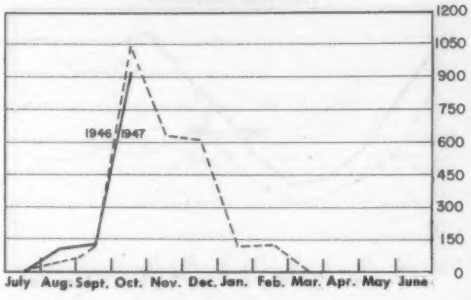
Plants under Food and Drug Administration Seafood Inspection Service



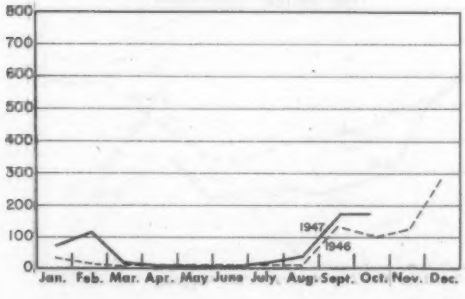
CALIFORNIA - TUNA



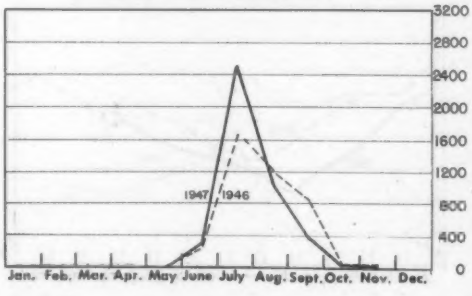
CALIFORNIA - PILCHARDS



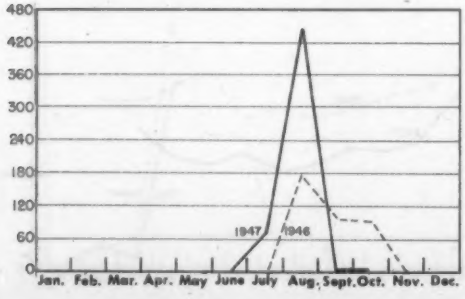
CALIFORNIA - MACKEREL



ALASKA - SALMON



WASHINGTON - PUGET SOUND SALMON

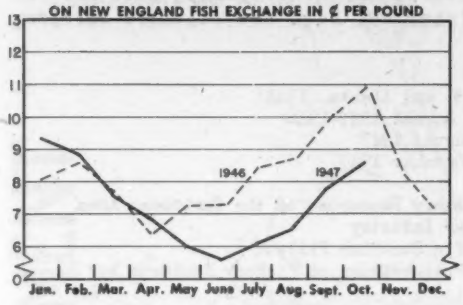


STANDARD CASES

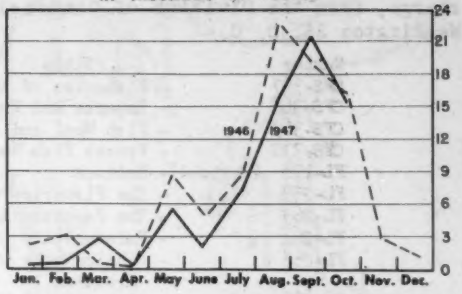
Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	No.1 picnic	7 oz.
TUNA	48	No. 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound tall	16 oz.

PRICES . IMPORTS and BY-PRODUCTS

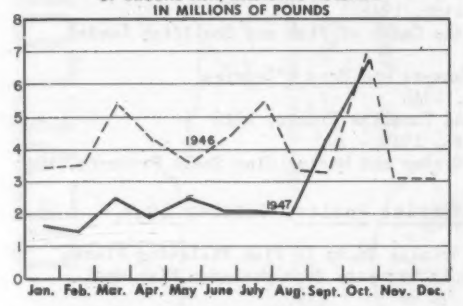
BOSTON - WEIGHTED AVERAGE PRICE
ON NEW ENGLAND FISH EXCHANGE IN ¢ PER POUND



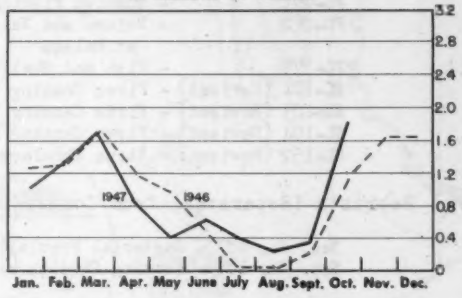
MAINE - IMPORTS OF SEA HERRING
IN THOUSANDS OF POUNDS



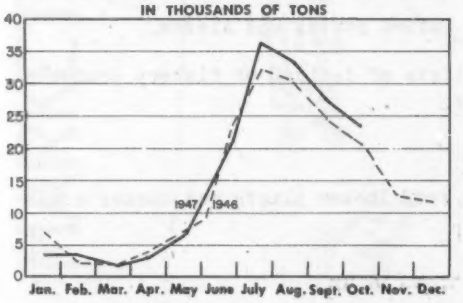
U.S. - IMPORTS OF FRESH & FROZEN FILLETS
OF GROUND FISH, INCLUDING ROSEFISH:-
IN MILLIONS OF POUNDS



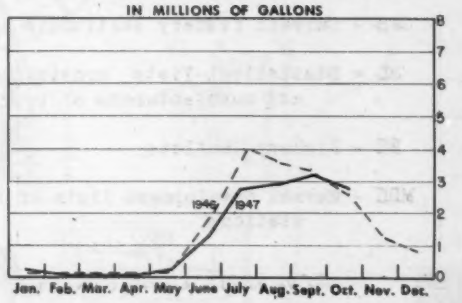
U.S. - IMPORTS OF SHRIMP FROM MEXICO
IN MILLIONS OF POUNDS



U.S. & ALASKA - PRODUCTION OF FISH MEAL
IN THOUSANDS OF TONS



U.S. & ALASKA - PRODUCTION OF FISH OIL
IN MILLIONS OF GALLONS



RECENT FISHERY PUBLICATIONS

Listed below are informational publications which recently have been processed by the Division of Commercial Fisheries. FL publications are available free of charge, from the Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C. Other listed publications may be obtained, also free of charge, from the Division of Commercial Fisheries, Fish and Wildlife Service, Washington 25, D. C.

Number	Title
CFS-357	- Fisheries of the U. S. and Alaska, 1944
CFS-368	- Imports and Exports, Annual 1942-1946
CFS-369	- Fish Meal and Oil, August 1947
CFS-370	- Frozen Fish Report, October 1947
FL-198 (Revised)	- Haddock
FL-259	- The Fisheries and Fishery Resources of the Caribbean Area
FL-263	- The Japanese Agar-Agar Industry
FL-264	- Palatability of Pacific Rockfish Fillets
FL-265	- Bibliography of the Preservation of Fishery Products by Freezing
FL-266	- Fisheries of Uruguay
FL-267	- Sao Paulo Fishing Industry
FL-271	- Spanish Fishing Industry, 1946
FL-272	- Volume and Value of the Catch of Fish and Shellfish Landed at Malaga
FL-275	- Fish and Shellfish Canapes and Hors d'Oeuvres
SL-101 (Revised)	- Firms Canning Salmon, 1946
SL-103 (Revised)	- Firms Canning Tuna and Tunalike Fishes, 1946
SL-104 (Revised)	- Firms Canning Mackerel, 1946
SL-152 (Revised)	- Firms Manufacturing Oyster and Marine Clam Shell Products, 1946

Reprints (Separates) from Commercial Fisheries Review, October 1947.

Sep. No. 187 - Bacterial Population of Brining Tanks in Fish Filleting Plants
Sep. No. 188 - Feeding Studies with Lipoid Extracts from Menhaden Fish Meal

Designations for fishery publications are interpreted as follows:

CFS - Current fishery statistics of the United States and Alaska.

SL - Statistical lists, consisting of lists of dealers of fishery products and manufacturers of byproducts.

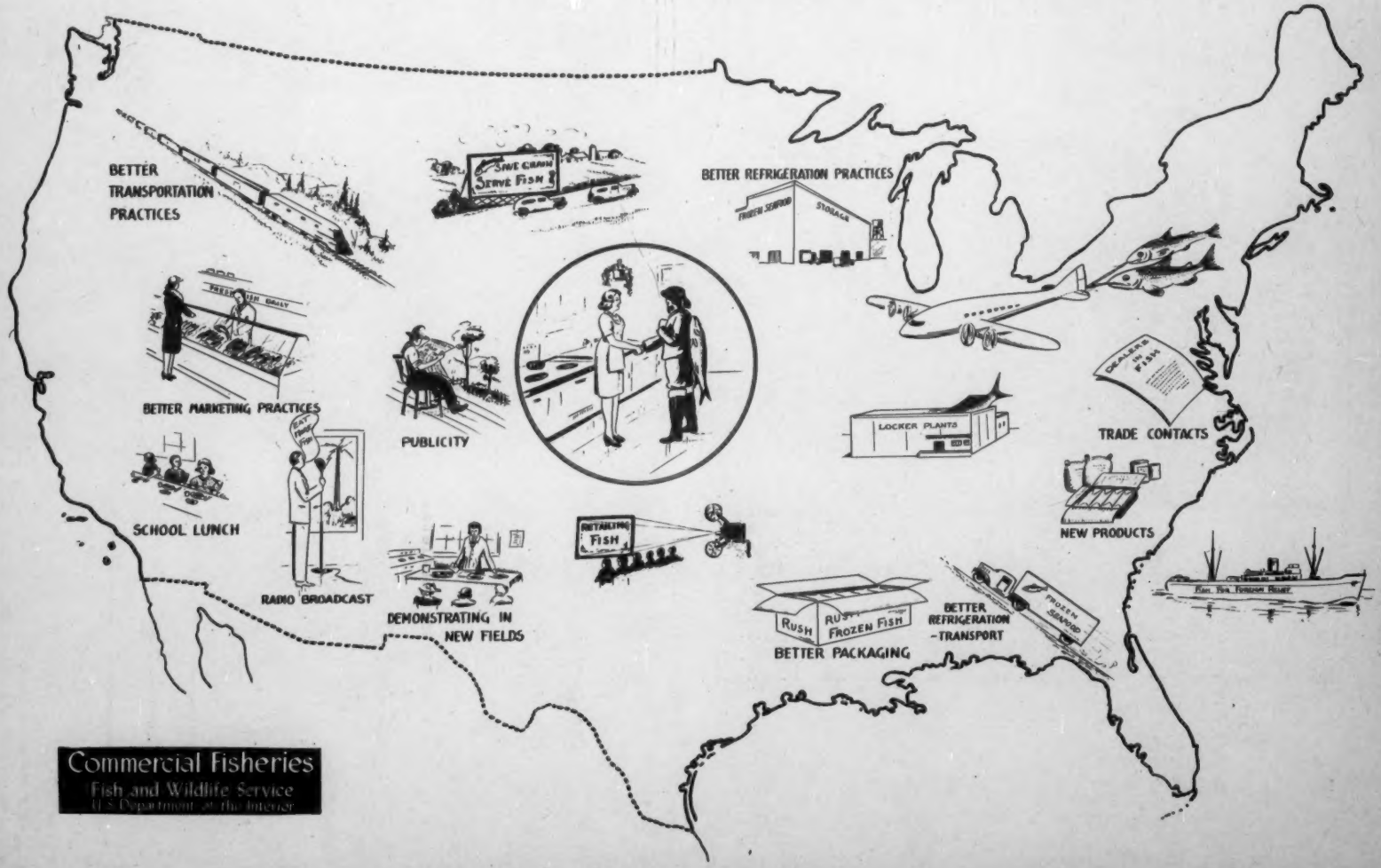
FL - Fishery leaflets.

MDL - Market development lists of frozen food locker plants and locker associations.

Illustrator--Gustaf T. Sundstrom

Compositors -- Jean Zalevsky and Norma D. Loeffel
Processing -- Miscellaneous Service Division

MARKET DEVELOPMENT



FISHERY RESOURCES OF MICRONESIA

This brief report presents salient facts concerning fisheries and other pertinent conditions in an area long closed to all but Japanese nationals. The report is based on data from "Survey of the Fisheries of the former Japanese Mandated Islands," prepared by the author as a member of the United States Commercial Company's Economic Survey, plus such general information as seemed necessary to round out the picture. Persons interested in the complete report should apply to Pacific Ocean Division, U. S. C. C., 1625 K Street, N. W., Washington, D. C.

The Economic Survey was undertaken by U. S. C. C. at the request of Commander Marianas, and under authorization from Commander-in-Chief, Pacific Fleet, during the period May 2 to August 31, 1946. All phases of native economy were examined by appropriate specialists assigned from U. S. C. C., other Government departments, the University of Hawaii, and the Bernice P. Bishop Museum, Honolulu.

--Fishery Leaflet 239

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